



S-112 Unit 13: Field Exercises

Summary

This field-based unit allows students to apply what they learned by demonstrating and practicing safe chainsaw handling skills in a closely supervised environment. Students must have opportunities to brush, limb, buck, and fell trees in low complexity situations, emphasizing safety and maintaining work area and cutting area control. Instructors focus on building confidence and skills while emphasizing that the sawyer is responsible for decision-making during saw operations.

Incident Position Description (IPD) Alignment

This unit aligns with the following Basic Faller (FAL3) IPD-specific duties located at <https://www.nwcg.gov/positions/basic-faller/incident-position-description>.

- Able to develop and safely execute a cut plan to resolve low complexity saw operations using conventional practices.
- Able to develop and safely execute a cut plan to resolve low complexity saw operations using conventional practices.
- Apply the Risk Management Process as stated in the *NWCG Incident Response Pocket Guide (IRPG)*, PMS 461.
- Apply Lookouts, Communications, Escape Routes, and Safety Zones (LCES) to all saw operations.
- Comply with all standards for chainsaw operations as defined in *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212, and established agency standards for saw operating procedures.
- Establish and maintain work area control.
- Develop and follow safe cutting area practices when using a swamper during saw operations.
- Learn to recognize changes in operational complexity and report pertinent changes to the appropriate supervisor.

Unit Objectives

- Perform a procedural sizeup and accurately determine complexity of saw operations.
- Demonstrate safe saw handling when brushing, limbing, bucking, and felling in low complexity situations.
- Take charge of a saw operation and effectively communicate with and direct the work of swampers.
- Establish and control the work and cutting areas during saw operations.

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Unit at a Glance

Below are **estimated** times for each topic or activity. Each day is approximately 390 minutes, excluding breaks.

Topics	Methods	Duration
Field Day One Introduction	Lecture	5 minutes
Skill Assessment	Lecture	5 minutes
Day 1 Briefing	Discussion	15 minutes
Procedural Sizeup Demonstration	Demonstration	30 minutes
Overview of Activities	Lecture	5 minutes
Personal Protective Equipment (PPE), General Equipment, and Radio Frequency Check	Lecture/Activity	5 minutes
Bucking, Limbing, and Brushing Activities	Demonstration/Activity	270 minutes
After Action Review	Discussion	15 minutes
Equipment Maintenance	Activity	40 minutes
Field Day Two Introduction	Lecture	5 minutes
Briefing	Discussion	10 minutes
Overview of Activities	Lecture	5 minutes
PPE, General Equipment, and Radio Frequency Check	Lecture/Activity	5 minutes
Felling and Stump Analysis Activity	Demonstration/Activity	300 minutes
After Action Review	Discussion	15 minutes
One-on-One Closeouts and Equipment Maintenance	Discussion	50 minutes
Total Field Day Duration		780 minutes (13 hours)

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Preparing to Instruct

Review the following reminders before delivering this unit to help ensure a successful learning experience:

- **Safety is the most critical objective of this course.** Your safety, the safety of the students, and the safety of the visiting public who may be in the work area are paramount. Have a communication plan and a medical response plan. Remind students of this throughout field day.
- The real learning begins once the students are given the opportunity to operate their chainsaws for the first time. Work to maximize every opportunity and allow as much “trigger time” as possible. With practice, students will become comfortable and safe chainsaw operators.
- Provide timely feedback to students. Ensure safe operations while allowing students to work through cutting operations and problem-solve on their own when it is safe.
- The target ratio for field days is one coach for every three students (1:3). The maximum ratio is one coach for every four students (1:4). Keep in mind that a smaller group size is preferred and equates to more “trigger time” for each student. More “trigger time” means greater opportunities for real-time feedback and on-the-job training. Encourage students to remain engaged even when not operating the chainsaw.
- All topics in this instructor guide should be covered; however, you have some flexibility on how they are facilitated. Decide how students are rotated through the stations. For example, students might be rotated while instructors stay at a particular station. Another method could be to have the students and their instructors rotate as a group throughout the field portion of the course. Other methods may also be used. These setups have pros and cons, and it is up to the lead instructor to decide how best to approach this process.
- Each student must bring all the Personal Protective Equipment (PPE) required for saw operations. Before the field days, assess if students lack any required PPE or equipment and try to accommodate any such needs to ensure students can fully participate. It is recommended that extra PPE and equipment be available onsite in case students arrive unprepared.
- During the field days, students will be given opportunities to perform various saw operations. Closely monitor students’ cutting procedures and correct their actions if you notice any unsafe acts or situations that present the risk of injury or property damage.
- Areas should include enough material for instructor demonstrations and for each student to practice limbing, brushing, bucking, and felling. The instructor should identify trees that students should cut prior to delivering the field day activities.
- If you are in a heavily wooded area, nature may already provide the setup for each group. In this case, make sure groups are spaced far enough apart to have room to practice all their activities.
- If trees are scarce in your area, bring logs and other materials and set them up on a sawbuck or lean them against other logs that the group can use.
- If you have funding available, a self-loading log truck may be used to dump logs and move them into positions to simulate felled trees and binds.
- Consider the distance from the classroom to the field location. Students may need to drive a long distance in the field to get to the cutting area. In some cases, bringing materials closer to the classroom may be necessary.

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Setting Up Field Day Activities (1-2 days ahead of time)

The importance of the field day sessions for students in a chainsaw training course cannot be overemphasized. This hands-on experience is a crucial part of their learning journey and provides them with the opportunity to put the knowledge they have learned into practice in a real-world setting as they begin to develop their skill as a sawyer. It is essential to thoroughly prepare so the experience is fun, exciting, safe, and productive for all participants. Each training session will present unique challenges and advantages based on factors such as geographic location, weather conditions, participant roster, cutting area location, available material, wildlife considerations, and overall land management objectives.

To make the field days effective and enjoyable, carefully consider the parameters mentioned earlier and integrate them into the development of field stations and scenarios for the students. By drawing from the course content, we can create real-life scenarios that students will likely encounter when working as sawyers on a team or crew.

Consider running the field days as if they were part of an actual incident. This requires contacting a dispatch center, assigning a name and number to the incident, and constructing a communications and incident medical plan. During the briefing at the beginning of each field day, be sure to include a medical plan that you could create prior to this day using the Medical Plan (ICS 206 WF) form.

This may not be an option for all groups hosting an S-112 course.

When possible, align the course training objectives with management objectives for the specific cutting location. Examples of management objectives could include clearing a trail system, opening roadways, reducing hazardous fuels, or felling hazardous trees in developed sites. By achieving these dual objectives, we provide valuable training opportunities for students and contribute to broader management objectives.

Approach the field training session with thoughtful planning and creativity to maximize the learning experience for students. By fostering partnerships and aligning our training objectives with broader management goals, we can enhance the overall impact of the field days during the chainsaw operations course.

Setting Up the Undercut Station

To set up stations for Day 2, follow this guidance:

- Consider the location of material needed to complete the assignments and what is currently available. In some situations, instructors may need to begin the felling activities first so trees are available for bucking.
- Provide enough room to have dedicated work areas and ensure students control the work area.
- Use large wood rounds, such as those shown in the images below, or the stump of an already felled tree to anchor the log vertically.
- Demonstrate and provide students with opportunities to practice each of the different types of undercuts, including open face, humbolt, and conventional.

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- Boring is required to secure the cut section of the log to the base and should, at this point, be completed by an instructor. In some cases, a student with prior experience and knowledge may be able to safely assist in making these bore cuts. The bore cut is done at an angle and penetrates both the butt of the log and the base allowing a wedge to be driven into the kerf to secure the two sections together.
- Additional wedges will be required to secure each undercut station properly. Plan for 2 or 3 wedges to be used at each undercut station.

The images below highlight the design and function of the undercut station, which will play a crucial role in the training program. Incorporating this station into our field scenarios will set our students up for success on day two of the field days by allowing them to concentrate on perfecting their cuts without the added risks associated with traditional felling practices.



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Day 1 Activities

Introduction

Time: 5 minutes

- ☐ Welcome students to the first field day and provide a brief overview of the day's schedule of activities.
- ☐ Tell students they will practice bucking, limbing, and brushing.
- ☐ Explain that on the second field day, they will practice making undercuts and felling trees.
- ☐ Ask students if they have any questions.

Skill Assessment

Time: 5 minutes

- ☐ Tell students they will be evaluated in the following performance areas:
 - Perform a procedural sizeup correctly and make an accurate complexity determination.
 - Maintain work area and cutting area control.
 - Have and wear PPE appropriately.
 - Demonstrate how to perform a safety check on their equipment.
 - Demonstrate proper saw maintenance.
 - Demonstrate how to start and stop a chainsaw.
 - Demonstrate safe chainsaw handling.
 - Demonstrate management of reactive forces.
 - Attend and participate in all activities.
 - Demonstrate humility and willingness to learn and accept feedback.
- ☐ Let them know that their performance will be discussed during the one-on-one closeout portion of this course.

Day 1 Briefing

Time: 15 minutes

- ☐ Brief the students on the following topics before starting field activities:
 - Land management objectives for the cutting area location.
 - The medical plan is based on what you should have already created using the Medical Plan (ICS 206 WF). This should include emergency transportation in the event of an injury (e.g., UTVs, ambulances, and closest hospitals).
 - Site-specific hazards.
 - Communication, including radio frequencies.
 - For the “Outside-in Top-down” portion of a procedural sizeup, be sure to clearly define “Big Picture” objectives and hazards versus “Cutting Area” objectives and hazards.

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- Safety Briefing (e.g., what happens if there is an Incident Within an Incident, examples of fatalities that have happened, and how rapid extraction could have improved those outcomes).
- Reinforce what influences human factors, how they affect complexity, and the ability to perform saw operations (e.g., personal stress, relationships, state of mind, physical condition, amount of sleep, weather, and group dynamics). Ask the group what might be impacting them today.

Procedural Sizeup Demonstration

Time: 30 minutes

- ☐ Discuss the procedural sizeup in chainsaw operations and help students understand how to assess the complexity of a cutting operation without using a chainsaw.
- ☐ Select an objective of low complexity without disclosing the complexity level.
- ☐ Have students walk through the procedural sizeup.
- ☐ Ensure students articulate each step of the procedural sizeup aloud as a team and come to a determination of the overall complexity of the saw operation.
- ☐ Note that the overall complexity of a saw operation can be accurately determined by averaging all factors of the procedural sizeup. Even individuals with little chainsaw experience can assess complexity levels effectively.
- ☐ Encourage students to ask questions and guide students through the process if necessary. Active participation in the training exercise will enhance the student's understanding of the procedural sizeup during saw operations and its direct correlation with complexity.
- ☐ After completing the first procedural sizeup, select another objective of higher complexity for the students to assess.
- ☐ Have students go through the procedural sizeup again and determine the overall complexity of the new saw operation.
- ☐ Note that the comparison between the two scenarios demonstrates how complexity can change and how it can be determined with little subjectivity.
- ☐ Tell students they will practice conducting a procedural sizeup throughout the day before starting any cutting operation.

Overview of Activities

- ☐ Explain that students will work in small groups with an assigned coach to practice bucking, limbing, and brushing.
- ☐ Break students into small groups and assign them to a coach.
- ☐ Tell students to go with their coach to their assigned area.

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Personal Protective Equipment (PPE), General Equipment, and Radio Frequency Check

Time: 5 minutes

- ☐ Tell students to wear their full fireline PPE if they are not already wearing it. Double-check that their equipment fits and functions properly. Students must have the following PPE:
 - Chaps
 - Gloves
 - Helmet
 - Eye/Face protection
 - Boots
 - Hearing protection
 - Long pants and long sleeve shirt
- ☐ Tell students to ensure they have the following general equipment:
 - Chainsaw
 - Srench/chainsaw bar wrench
 - Chain file
 - Approved safety container for chainsaw fuel and bar oil
 - Proper wedges
 - A 3 to 5-pound single-bit axe or pounder
 - A bar cover
- ☐ Tell students to check to make sure they are on the same radio frequency that was provided during the briefing.
- ☐ Tell students to perform a safety check on their saw.
- ☐ If students do not have proper functioning equipment, lend extra equipment to them if available. If equipment is not available, the student cannot participate in this portion of the course.

Bucking, Limbing, and Brushing Activities

Time: 270 minutes

- ☐ Have students practice brushing, limbing, and bucking based on the chosen setup.
- ☐ Provide feedback on their performance.
- ☐ Use the example scenarios on the next page to provide realism to the activities.
- ☐ Follow these guidelines for all cutting operations:
 - Demonstrate how to perform each type of operation (brushing, limbing, and bucking), including body positioning and handling, before students begin to practice.

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- Throughout each activity, emphasize body positioning, handling, and safety. Remind students to take their time and focus on their technique so they can develop good habits.
 - Provide opportunities for each student to act as both the lead sawyer and a swamper and encourage team decision-making.
 - Develop and discuss saw team tactics prior to engaging and ensure everyone is clear on the plan.
 - Develop hand signals or other means of communication to enhance the sawyer's and swamper's ability to work together safely and maintain control of the cutting area during saw operations.
 - Use flagging tape to indicate various features (trail clearance widths, locations where cuts should be made, identification of hazards, etc.)
 - Remind students throughout the day that they must conduct a procedural sizeup before starting any cutting operation.
 - The sawyer and swamper should be encouraged to work independently when possible and then compare findings as a group.
 - At one point during the training, drop a tree so students can practice processing it after it falls.
- ❑ During lunch, discuss how students should respond to an Incident Within an Incident. Cover the Medical Plan (ICS 206 WF) and communication procedures/reporting with a discussion about a rudimentary plan for treatment and transport.

General Forest Area

When aiming to enhance the learning for students in a general forest area, it becomes increasingly important to use imagination and creativity to develop meaningful saw operation scenarios. This narrative should outline specific goals and challenges, allowing students to apply their skills and knowledge in a practical setting.

General forest areas often lack defined structures or terrain features. In these situations, flagging plays a crucial role in guiding students and ensuring a meaningful cutting assignment. By using flagging, instructors can easily identify the route of a trail or roadway to direct the activities of students. This not only encourages cuts to be made in specific locations but also ensures variation in binds and cutting opportunities are present. Flagging can also help identify fire direction, hazard trees, start/stop locations, etc., all of which will contribute to a more comprehensive saw operation scenario. Providing students with clear objectives for the cutting assignment will guide them in creating effective saw team tactics and communication methods and aid in overall decision-making.

Example Scenarios

Following are example scenarios and scripts instructors can use to provide realism to the activities.

Trail Systems

As we gear up to clear our designated section of trail in advance of the approaching fire, I want to provide you with some important guidelines and instructions to ensure our work is efficient and effective. The trail will serve as a containment line, so we must clear it properly to prevent unnecessary

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fuel loading and improve its ability to hold or burn if needed. Please refer to the trail maintenance standard and clearing guidelines specific to the trail type and class we are working on.

The Resource Advisor provided instructions in the IAP:

1. Scatter all cut materials on the green side of the trail to avoid creating additional fuel loading and hide cut material.
2. Remove all ladder fuels on both sides of the trail to enhance its fire containment capabilities and improve hiking conditions.
3. Limb and buck all downed logs to 5-foot lengths and stack them perpendicular to the trail on the green side.

Your attention to detail and adherence to these instructions will be crucial in ensuring the safety and effectiveness of fuel reduction work. Please do not hesitate to ask if you have any questions or need clarification on any of the instructions.

Fuels Reduction

We have been tasked with a critical assignment to prepare a contingency line along the roadway that will serve as the “Big Box” in the event of the fire spotting or jumping the handline. This task is of utmost importance, and our attention to detail is crucial to the success of containment efforts.

I received these specific instructions for prepping the road during our initial briefing:

1. Remove all ladder fuels and brush on both sides of the road, including trees up to 5-8 inches in diameter.
2. Stack all cut material in neat piles perpendicular to the road on the green side as we move along.
3. Another crew will follow behind us to chip the piles and scatter the chips on the green side.
4. Buck all logs to 5-foot lengths and stack them in piles parallel to the road.

It is essential that we work effectively and diligently to clear the roadway and stack the cut materials as instructed. Remember, this road is open to vehicle traffic, so keep your head on a swivel and remain alert. This is a high-priority area for the fire, and they want to make sure we are leaving a good product that will help slow or eliminate the movement by the fire past this point.

Administrative Site

We have been assigned the crucial task of removing all hazardous fuels around the buildings and felling any standing dead hazard trees identified with flagging. The fire is a long way off, but these buildings are historic and extremely important to the unit. It is essential that we follow the instructions we have been given to ensure the safety of the area and protect the historic buildings.

We have been asked to accomplish the following:

1. Remove all hazardous fuels around the buildings and fell any standing dead hazard trees marked with flagging.
2. Cut and stack all brush in the specified areas and cover them with plastic. These piles will be burned in the fall.
3. Do not damage any water lines or other infrastructure in the area during removal. Let's have our most experienced fallers look at the trees to ensure they can be felled without causing any property damage.

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4. Buck all logs to 5-foot lengths and stack them in piles. This material will be used to construct buck and rail fencing later.

Pay attention to the details and work safely to complete this task. Our collective effort in following these instructions will contribute to the overall safety and protect these important historic structures.

After Action Review

Time: 15 minutes

- ☐ Wrap up Day 1 with an After Action Review (AAR).
- ☐ Remind students of the importance of holding an AAR. Indicate that feedback is a loop that helps with growth and improvement, so encourage open and honest communication from all participants.
- ☐ Review the following questions with the group:
 - What went well?
 - What could have been improved?
 - What ideas are there for enhancing performance in the upcoming days?
 - Review areas that need reinforcing for safety and correct completion of the activity.
- ☐ Tell students that they will have opportunities to practice making undercuts and felling trees during the Day 2 Field Exercises.

Equipment Maintenance

Time: 40 minutes

- ☐ Supervise students as they complete maintenance on their equipment in preparation for the second day. Students should complete the same maintenance tasks they would perform in the field. Per PMS 212, this includes:
 - Filling fuel and bar oil.
 - Sharpening the chain using file guide.
 - Using a depth gauge tool to check depth gauge.
 - Inspecting the wear of chain, use indicators on driver.
 - Removing the side cover plate and cleaning all built up debris.
 - Cleaning the bar grooves and chain oil hole on bar.
 - Inspecting the bar for wear and burs and file if needed.
 - Flipping the bar.
 - Inspecting and either cleaning or replacing the air filter per the manufacturer's recommendation.
 - Reporting any damage to their instructor.

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- ☐ Instructors are encouraged to use this time to provide one-on-one guidance to students. This may include guidance related to maintenance and a review of their performance during the day.
- ☐ Dismiss students for the day and remind them to return to the site tomorrow for the second day of the field exercises.

Day 2 Activities

Introduction

Time: 5 minutes

- ☐ Welcome students to the second field day.

Day 2 Briefing

Time: 10 minutes

- ☐ Provide students with a briefing for the day and include the following topics:
- ☐ Land management objectives for the cutting area location.
 - The medical plan is based on what you should have already created using the Medical Plan (ICS 206 WF). This should include emergency transportation in the event of an injury (e.g., UTVs, ambulances, and closest hospitals)
 - Site-specific hazards.
 - Communication, including radio frequencies.
 - For the “Outside-in Top-down” portion of a procedural sizeup, be sure to clearly define “Big Picture” objectives and hazards versus “Cutting Area” objectives and hazards.
 - Safety Briefing (e.g., what happens if there is an Incident Within an Incident, examples of fatalities that have happened, and how rapid extraction could have improved those outcomes).
- ☐ Reinforce the things that impact human factors, how they affect complexity, and the ability to perform saw operations. For example, things that impact human factors include, but are not limited to, personal stress, relationships, state of mind, physical condition, amount of sleep, weather, and group dynamics. Ask the group what might be impacting them today.

Personal Protective Equipment (PPE), General Equipment, and Radio Frequency Check

Time: 5 minutes

- ☐ Tell students to wear their full fireline PPE if they are not already wearing it. Double-check that their equipment fits and functions properly. Refer to the list provided on Day 1.
- ☐ Tell students to ensure they have the same general equipment as provided on Day 1.
- ☐ Tell students to check to make sure they are on the same radio frequency that was provided during the briefing.
- ☐ Tell students to perform a safety check on their saw.

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- ☐ If students do not have proper functioning equipment, lend extra equipment to them if available. If equipment is not available, the student cannot participate in this portion of the course.

Overview of Activities

- ☐ Explain that students will work in small groups with an assigned coach to practice felling trees and conducting a stump analysis.
- ☐ Break students into small groups.
- ☐ Tell students to go with their coach to their assigned area.

Felling and Stump Analysis Activity

Time: 300 minutes

- ☐ Select an area with enough trees so each student in your group can practice felling.
- ☐ Tell students that they should review the Basic Saw Operations and Handling and Directional Felling sections of *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212.
- ☐ Tell students that for each assignment, they will take turns demonstrating how to:
 - Wear PPE correctly.
 - Conduct a procedural sizeup.
 - Fell trees, including proper body positioning and handling.
 - Perform a stump analysis.
- ☐ Review the different types of undercuts, including open face, humbolt, and conventional.
 - Tell students the type of undercut you would like them to make. The type of cut may depend on regional preferences and fuel types.
 - Demonstrate how to make the type of undercut you would like students to perform.
- ☐ Tell students that they will now take turns practicing felling.
 - Identify a tree with low complexity and select a student to begin. If time allows, give students a more complex assignment on their second turn.
 - After the student fells the tree, remind them to complete a stump analysis. Start the discussion by asking students how they think they did and have them explain their process aloud.
 - After the student completes the stump analysis, ask other students if they have feedback.
 - Provide feedback on their performance.
 - Select another student to begin and repeat until all students have completed the assignment.
- ☐ When all students have completed the activity, provide feedback on what went well, what could be improved, and answer any questions the students may have.
- ☐ If time allows, let students continue taking turns practicing felling assignments and stump analysis.

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After Action Review

Time: 15 minutes

- ☐ Wrap up Day 2 with an After Action Review (AAR).
- ☐ Remind students of the importance of holding an AAR. Indicate that feedback is a loop that helps with growth and improvement, so encourage open and honest communication from all participants.
- ☐ Review the following questions with the group:
 - What went well?
 - What could have been improved?
 - What ideas are there for enhancing performance in the upcoming days?
 - Review areas that need reinforcing for safety and correct completion of the activity.
- ☐ Answer any final questions students may have regarding the activities of the day.

One-on-One Closeouts and Equipment Maintenance

Time: 50 minutes

- ☐ Spend approximately 5 minutes conducting 1-on-1 closeout interviews with each student and review the Skill Assessment. Alternatively, 1-on-1 closeout interviews can be conducted during the stump analysis instead of at the end of Day 2.
- ☐ While students are waiting for their 1-on-1, have them refurbish their equipment.
- ☐ To determine whether a student passes the course, assess whether they were able to do the following by the completion of the course:
 - Perform a procedural sizeup correctly and make an accurate complexity determination.
 - Maintain work area and cutting area control.
 - Have and wear PPE appropriately.
 - Demonstrate how to perform a safety check on their equipment.
 - Demonstrate proper saw maintenance.
 - Demonstrate how to start and stop a chainsaw.
 - Demonstrate safe chainsaw handling.
 - Demonstrate management of reactive forces.
 - Attend and participate in all activities.
 - Demonstrate humility and willingness to learn and accept feedback.